Contents Volume 16:1 March 1993

Gopnik, A. How we know our minds: The illusion of first-person knowledge of intentionality 1

Goldman, A. I. The psychology of folk psychology 15

Open Peer Commentary

Armstrong, D. M. Causes are perceived and introspected 29
Baron-Cohen, S. The concept of intentionality: Invented or innate? 29
Bartsch, K. & Estes, D. Are false beliefs representative mental states? 30
Butterworth, G. Towards an ecology of mind 31
Campbell, R. L. & Bickhard, M. H. Knowing levels and the child's understanding of mind 33
Cassidy, K. W. There's more to mental states than meets the inner "I" 34
Chalmers, D. J. Self-ascription without qualia: A case study 35
Chandler, M. & Carpendale, J. The naked truth about first-person knowledge 36
Chater, N. Categorization, theories and folk psychology 37
Czyzewska, M. & Lewicki, P. How directly do we know our minds? 37
Daniel, S. The anthropology of folk psychology 38
Dittrich, W. H. & Lea, S. E. G. Intentionality, mind and folk psychology 39
Ericsson, K. A. Recall or regeneration of past mental states: Toward an account in terms of cognitive processes 41
Fetzer, J. H. Goldman has not defeated folk functionalism 42
Goldman, A. I. Competing accounts of belief-task performance 43
Gopnik, A. Theories and qualities 44
Gordon, R. M. Self-ascription of belief and desire 45
Gunderson, K. On behalf of phenomenological parity for the attitudes 46
Gurd, J. M. & Marshall, J. C. Know my own mind? I should be so lucky! 47
Harris, P. L. First-person current 48
Heil, J. Unraveling introspection 49
Hill, C. S. Qualitative characteristics, type materialism and the circularity of analytic functionalism 50
Horgan, T. Analytic functionalism without representational functionalism 51
Jackson, F. Qualia for propositional attitudes? 52
Johnson, C. N. Gopnik's invention of intentionality 52
Josephson, B. D. "Good developmental sequence" and the paradoxes of children's skills 53
Keysar, B. Common sense and adult theory of communication 54
Kobes, B. W. Self-attributions help constitute mental types 54
Leslie, A. M., German, T. P. & Happé, F. G. Even a theory-theory needs information processing: ToMM, an alternative theory-theory of the child's theory of mind 56
Levine, A. & Schwarz, G. Three inferential temptations 57
Loar, B. Functionalism can explain self-ascription 58
Ludlow, P. & Martin, N. The fallibility of first-person knowledge of intentionality 60
Mele, A. Reporting on past psychological states: Beliefs, desires and intentions 61
Moore, C. & Barresi, J. Knowledge of the psychological states of self and others is not only theory-laden but also data-driven 61
Morris, W. E. & Richardson, R. C. Mismatching categories? 62
Morton, A. Heuristics and counterfactual self-knowledge 63
Nichols, S. Developmental evidence and introspection 64
Olson, D. R. & Astington, J. W. The role of concepts in perception and inference 65
Perner, J. A plea for the second functionalist model and the insufficiency of simulation 66
Pietroski, P. M. First-person authority and beliefs as representations 67
Pillow, B. H. Limitations on first-person experience: Implications of the "extent" 69
Plaut, D. C. & Karmiloff-Smith, A. Representational development and theory-of-mind computations 70
Pratt, I. Matching and mental-state ascription 71
Rachlin, H. Theory-theory theory 72
Rakover, S. S. Theories of mind: Some methodological/conceptual problems, and an alternative approach 73
Rey, G. Why presume analyses are on-line? 74
Rips, L. J. Qualities and relations in folk theories of mind 75
Russell, J. On leaving your children wrapped in thought 76
Saunders, B. A. C. Disenshrining the Cartesian self 77
Shoemaker, S. Special access lies down with theory-theory 78
Siegal, M. Knowing children's minds 79
Stanovich, K. E. The developmental history of an illusion 80
Sterelny, K. Categories, categorisation and development: Introspective knowledge is no threat to functionalism 81
Thompson, N. S. Why Alison Gopnik should be a behaviorist 83
Tomasello, M. Where's the person? 84
Velmans, M. Common sense, functional theories and knowledge of the mind 85
Woodfield, A. Three questions for Goldman 86
Zaitchik, D. & Samet, J. Intentionality, theoreticity and innateness 87
Zelazo, P. D. & Frye, D. The psychologist's fallacy (and the philosopher's omission) 89

EDITORIAL COMMENTARY 90

Authors' Responses

Gopnik, A. Theories and illusions 90
Goldman, A. I. Functionalism, the theory-theory and phenomenology 101

Murray, D. J. A perspective for viewing the history of psychophysics 115

Open Peer Commentary

Anderson, N. H. Nonconscious sensation and inner psychophysics 137
Borg, G. A perspective on psychophysics is not derived just from the history of psychophysicists 138
Brigner, W. L. The phantom limb extrapolation 139
Gigerenzer, G. From metaphysics to psychophysics and statistics 139
Gregson, R. A. M. The head and tail of psychophysical algebra 141
Grüsser, O.-J. The discovery of the psychophysical power law by Tobias Mayer in 1754 and the psychophysical hyperbolic law by Ewald Hering in 1874 142
Gundlach, H. Psychophysics, its history and ontology 144
Handel, S. Inner psychophysics, neurelectric function and perceptual theories 145
Heidelberger, M. Fechner's impact for measurement theory 146
Hornstein, G. A. The chimera of psychological measurement 148
Krueger, L. E. History of psychophysics: Some unanswered questions 149
Laming, D. The antecedents of signal detection theory 151
Lebedev, A. N. Derivation of Stevens's exponent from neurophysiological data 152
Link, S. Fechner's theory of mental measurement 153
Lockhead, G. R. A parallel view of the history of psychophysics 154
Luce, R. D. Let's not promulgate either Fechner's erroneous algorithm or his unidimensional approach 155
Marks, L. E. Quantifying, valuing, choosing 156
Olsson, M., Harder, K. & Baird, J. C. What Ekman really said 157
Petrusic, W. M. Response time based psychophysics: An added perspective 158
Ross, H. E. Unwarranted popularity of a power function for heaviness estimates 159
Stout, D. A. Bedrock metaphysics, fossil fuel psychophysics 160
Teghtsoonian, R. Sensation strength: Another point of view 161
Treisman, M. Psychophysics and the mind-brain problem 162
van Brakel, J. The analysis of sensations as the foundation of all sciences 163
Wagner, M. On the construction of psychophysical reality 164
Weiss, D. J. Looking backward: Progress in outer psychophysics 165
Whittle, P. A perspective for viewing the present of psychophysics 165

Author's Response

Murray, D. J. The place of psychophysics in the history of sensory science 166

Continuing Commentary

On Benbow, C. P. (1988) Sex differences in mathematical reasoning abil.cy in intellectually talented preadolescents: Their nature, effects and possible causes. BBS 11:169–232. 187

Thomas, H. A theory explaining sex differences in high mathematical ability has been around for some time 187

On Searle, J. R. (1990) Consciousness, explanatory inversion and cognitive science. BBS 13:585–642. 189

Goel, V. Comments on the Connection Principle 189
Julesz, B. Consciousness and focal attention: Answer to John Searle 191
Ludwig, K. A dilemma for Searle's argument for the Connection Principle 194
Pfeifer, K. Causal dispositions, aspectual shape and intentionality 196
Shanon, B. What next? Ramifications for empirical psychology 197

Author's Response

Searle, J. R. Consciousness, attention and the Connection Principle 198

On Gray, J. A., Feldon, J., Rawlins, J. N. P., Hemsley, D. R. & Smith, A. D. (1991) The neuropsychology of schizophrenia. BBS 14:1–84. 203

Joseph, M. H. The neuropsychology of schizophrenia: Beyond the dopamine hypothesis to behavioural function 203
Pickering, A. D. Schizophrenia: In context or in the garbage can? 205
Previc, F. H. A "neuropsychology of schizophrenia" without vision 207
Smothergill, D. W. & Kraut, A. G. Toward the more direct study of attention in schizophrenia: Alertness decrement and encoding facilitation 208

Authors' Response

Hemsley, D. R., Rawlins, J. N. P., Feldon, J., Jones, S. H. & Gray, J. A. The neuropsychology of schizophrenia: Act 3 209

Contents Volume 16:2 June 1993

Landau, B. & Jackendoff, R. "What" and "where" in spatial language and spatial cognition **217**

Open Peer Commentary

Bennett, D. C. There is more to location than prepositions 239
Bridgeman, B. Spatial and cognitive vision differentiate at low levels, but not in language 240
Brown, H. D. The role of cerebral lateralization in expression of spatial cognition 240
Bryant, D. J. Frames of reference in the spatial representation system 241
Corballis, M. C. Generative versus nongenerative thought 242
Deregowski, J. B. Are spatial representations flattish? 243
Feldman, J. Causal models of spatial categories 244
Friederici, A. D. On places, prepositions and other relations 245
Heidorn, P. B. & Hirtle, S. C. Is spatial information imprecise or just coarsely coded? 246
Hoffman, D. D. No perception without representation 247
Ingle, D. Evolution and physiology of "what" versus "where" 247
Mainwaring, S. D. Distinguishing the linguistic from the sublinguistic and the objective from the configurational 248
Olson, D. R. Spatial development 249
Slobin, D. I. Is spatial language a special case? 249
Tarr, M. J. From perception to cognition 251
Tversky, B. & Clark, H. H. Prepositions aren't places 252
Wagemans, J. From observations on language to theories of visual perception 253
Wolfe, J. M. Talking to yourself about *what* is *where*: What is the vocabulary of preattentive vision? 254

Authors' Response

Landau, B. & Jackendoff, R. Whence and whither in spatial language and spatial cognition? 255

Pérusse, D. Cultural and reproductive success in industrial societies: Testing the relationship at the proximate and ultimate levels **267**

Open Peer Commentary

Alcock, J. Exadaptations 283
Betzig, L. Where are the bastards' daddies? 284
Bookstein, F. L. Converting cultural success into mating failure by aging 285
Borgerhoff Mulder, M. Cultural success and the study of adaptive design 286
Broude, G. J. Attractive single gatherer wishes to meet rich, powerful hunter for good time under mongongo tree 287
Carey, G. The status/reproduction correlation: But what is the mechanism? 289
Daly, M. Beyond reproductive success differentials 289
Dickemann, M. Human reproductive plasticity 290
Dunbar, R. I. M. On the evolution of alternative reproductive strategies 291
Dupré, J. Scientism, sexism and sociobiology: One more link in the chain 292
Flinn, M. V. Evolutionary psychology: Black box "mechanisms"? 293
Glenn, N. D. Some evidence on cultural and reproductive success in the United States 293
Hartung, J. Pérusse is right 294
Hill, E. M. Are our reproductive choices affected by aspects of socioeconomic resources? 294
Irons, W. Monogamy, contraception and the cultural and reproductive success hypothesis 295
Kaplan, H. The problem of resource accrual and reproduction in modern human populations remains an unsolved evolutionary puzzle 297
Kemper, T. D. Social dominance attainment, testosterone, libido and reproductive success 298
Kenrick, D. T. Do these sociobiologists have an answer for everything? 299
Low, B. S. Resources and reproduction: What hath the demographic transition wrought? 300
Mealey, L. Sociobiology or evolutionary psychology? The debate continues 300
Mueller, U. Actual and potential reproduction: There is no substitute for victory 301
Plotkin, H. C. Stretching the theory beyond its limits 303
Silverberg, J. The adaptiveness of imaginatively eliminating behaviors: Stripping the cultural varnish from the natural evolutionary woodwork 304
Simpson, J. A. Male reproductive success as a function of social status: Some unanswered evolutionary questions 305
Smith, E. A. Cultural versus reproductive success: Resolving the conundrum 307
Steven, D. C. "Potential" reproductions as an alternative proxy for reproductive success: A great direction, but the wrong road 307
Thiessen, D. Sexual momentum may be independent of social status 308
Thompson, N. S. Oh no! Not social Darwinism *again*! 309
Vining, D. R., Jr. Problems with the Darwinian hypothesis 310
Wahlsten, D. Sociobiology flops again 310
Wilson, M. What is the adaptation: Status striving, status itself or parental teaching biases? 311

Author's Response

Pérusse, D. Human status seeking is a Darwinian adaptation 312

Johnson-Laird, P. N. & Byrne, R. M. J. Précis of *Deduction* 323

Open Peer Commentary

Andrews, A. D. Mental models and tableau logic 334
Bach, K. Getting down to cases 334
Bara, B. G. Toward a developmental theory of mental models 336
Baron, J. Deduction as an example of thinking 336
Barwise, J. Everyday reasoning and logical inference 337
Braine, M. D. S. Mental models cannot exclude mental logic and make little sense without it 338
Bundy, A. "Semantic procedure" is an oxymoron 339
Chater, N. Mental models and nonmonotonic reasoning 340
Cohen, L. J. Some difficulties about deduction 341
Crawford, J. M. Tractability considerations in deduction 343
Davis, H. Deduction by children and animals: Does it follow the Johnson-Laird & Byrne model? 344
Engel, P. Mental-model theory and rationality 345
Evans, J. St. B. T. On rules, models and understanding 345
Falmagne, R. J. On modes of explanation 346
Fetzer, J. H. The argument for mental models is unsound 347
Fillenbaum, S. Deductive reasoning: What are taken to be the premises and how are they interpreted? 348
Fisher, A. Mental models and informal logic 349
Galotti, K. M. & Komatsu, L. K. Why study deduction? 350
Garnham, A. A number of questions about a question of number 350
Grandy, R. E. Rule systems are not dead: Existential quantifiers are harder 351
Green, D. W. Mental models: Rationality, representation and process 352
Hodges, W. The logical content of theories of deduction 353
Inder, R. Architecture and algorithms: Power sharing for mental models 354
Legrenzi, P. & Sonino, M. The content of mental models 354
Luchins, A. S. & Luchins, E. H. Gestalt theory, formal models and mathematical modeling 355
MacLennan, B. J. Visualizing the possibilities 356
Manktelow, K. I. Models for deontic deduction 357
ter Meulen, A. G. B. Situation theory and mental models 358
Newstead, S. E. Do mental models provide an adequate account of syllogistic reasoning performance? 359
Oaksford, M. Mental models and the tractability of everyday reasoning 360
Over, D. Deduction and degrees of belief 361
Polk, T. A. Mental models, more or less 362
Pollard, P. There is no need for (even fully fleshed out) mental models to map onto formal logic 363
Savion, L. Unjustified presuppositions of competence 364
Stenning, K. & Oberlander, J. Nonsentential representation and nonformality 365
Stevenson, R. J. Models, rules and expertise 366
Tweney, R. D. Scientific thinking and mental models 366
Wetherick, N. E. More models just means more difficulty 367

Authors' Response

Johnson-Laird, P. N. & Byrne, R. M. J. Mental models or formal rules? 368

Continuing Commentary

On Dennett, D. C. (1988) Précis of *The Intentional Stance.* BBS 11:495–546. 381

Bennett, J. Comments on Dennett from a cautious ally 381
Ringen, J. Dennett's intentions and Darwin's legacy 386

Author's Response

Dennett, D. C. Evolution, teleology, intentionality 389

On Turkkan, J. S. (1989) Classical conditioning: The new hegemony. BBS 12:121–179. 392

Malmo, R. B. & Furedy, J. J. Settling the stimulus-substitution issue is a prerequisite for sound nonteleological neural analysis of heart-rate deceleration conditioning 392
Merckelbach, H. & van den Hout, M. Classical conditioning: The hegemony is not ubiquitous 393
Tonneau, F. Stimulus correlations in complex operant settings 393

Author's Response

Turkkan, J. S. Functions and effects of Pavlovian stimuli 394

On Cicchetti, D. V. (1991) The reliability of peer review for manuscript and grant submissions: A cross-disciplinary investigation. BBS 14:119–186. 398

Crothers, C. Peer review reliability: The hierarchy of the sciences 398
Luce, R. D. Reliability is neither to be expected nor desired in peer review 399
Sinclair, J. D. Drop censorship in science 400

Author's Response

Cicchetti, D. V. The reliability of peer review for manuscript and grant submissions: "It's like déjà vu all over again!" 401

On Velmans, M. (1991) Is human information processing conscious? BBS 14:651–726. 404

Glicksohn, J. Putting consciousness in a box: Once more around the track 404
Habibi, A. & Bendele, M. S. On relativity of time and the causal status of consciousness 404
EDITORIAL NOTE 405
Navon, D. Experience and information should be distinguished 405
Neill, W. T. Consciousness, not focal attention, is causally effective in human information processing 406
Rao, K. R. Consciousness, awareness and first-person perspective 407
EDITORIAL NOTE 409

Author's Response

Velmans, M. Consciousness, causality and complementarity 409

Contents Volume 16:3 September 1993

Shastri, L. & Ajjanagadde, V. From simple associations to systematic reasoning: A connectionist representation of rules, variables and dynamic bindings using temporal synchrony 417

Open Peer Commentary

Barnden, J. A. Time phases, pointers, rules and embedding 451
Bauer, M. I. Plausible inference and implicit representation 452
Cooper, P. R. Could static binding suffice? 453
Cottrell, G. W. From symbols to neurons: Are we there yet? 454
Dawson, M. R. W. & Berkeley, I. Making a middling mousetrap 454
Diederich, J. Reasoning, learning and neuropsychological plausibility 455
Dorffner, G. Connectionism and syntactic binding of concepts 456
Eckhorn, R. Dynamic bindings by real neurons: Arguments from physiology, neural network models and information theory 457
Feldman, J. A. Toward a unified behavioral and brain science 458
Freeman, W. J. Deconstruction of neural data yields biologically implausible periodic oscillations 458
Garson, J. W. Must we solve the binding problem in neural hardware? 459
Grossberg, S. Self-organizing neural models of categorization, inference and synchrony 460
Halford, G. S. Competing, or perhaps complementary, approaches to the dynamic-binding problem, with similar capacity limitations 461
Hampson, P. J. Rule acquisition and variable binding: Two sides of the same coin 462
Hirst, G. & Wu, D. Not all reflexive reasoning is deductive 462
Hölldobler, S. On the artificial intelligence paradox 463
Hummel, J. E. & Holyoak, K. J. Distributing structure over time 464
Koerner, E. Synchronization and cognitive carpentry: From systematic structuring to simple reasoning 465
Martin, D. L. Reflections on reflexive reasoning 466
Munsat, S. What we know and the LTKB 466
Oaksford, M. & Malloch, M. Computational and biological constraints in the psychology of reasoning 468
Ohlsson, S. Psychological implications of the synchronicity hypothesis 469
Palm, G. Making reasoning more reasonable: Event-coherence and assemblies 470
Rohwer, R. Useful ideas for exploiting time to engineer representations 471
Sloman, S. Do simple associations lead to systematic reasoning? 471
Strong, G. W. Phase logic is biologically relevant logic 472
Thorpe, S. J. Temporal synchrony and the speed of visual processing 473
Touretzky, D. S. & Fahlman, S. E. Should first-order logic be neurally plausible? 474
Tsuda, I. Dynamic-binding theory is not plausible without chaotic oscillation 475
Young, M. P. Ethereal oscillations 476

Authors' Response

Shastri, L. & Ajjanagadde, V. A step toward modeling reflexive reasoning 477

Tomasello, M., Kruger, A. C. & Ratner, H. H. Cultural learning 495

Open Peer Commentary

Bard, K. A. A developmental theory requires developmental data 511
Baron-Cohen, S. Are children with autism acultural? 512
Barresi, J. & Moore, C. Sharing a perspective precedes the understanding of that perspective 513
Boesch, C. Towards a new image of culture in wild chimpanzees? 514
Braten, S. Social-emotional and auto-operational roots of cultural (peer) learning 515
Bruner, J. Do we "acquire" culture or vice versa? 515
Byrne, R. W. Hierarchical levels of imitation 516
Collier, J. Whence the motive for collaboration? 517
Forman, E. A. What is the difference between cognitive and sociocultural psychology? 518
Gabora, L. M. Cultural learning as the transmission mechanism in an evolutionary process 519
Goldman, A. I. Learning stages and person conceptions 520
Gómez, J. C. Agents, intentions and enculturated apes 520
Gopnik, A. & Meltzoff, A. Imitation, cultural learning and the origins of "theory of mind" 521
Harwood, R. L. Child development and theories of culture: A historical perspective 523
Hauser, M. D. Cultural learning: Are there functional consequences? 524
Heyes, C. M. Imitation without perspective-taking 524
Hobson, R. P. On acquiring the concept of "persons" 525
Ingold, T. A social anthropological view 526
King, B. J. The primate behavioral continuum: What are its limits? 527
Lillard, A. S. Moving forward on cultural learning 528
Midford, P. Cultural transmission is more than cultural learning 529
Mitchell, R. W. Kinesthetic-visual matching, perspective-taking and reflective self-awareness in cultural learning 530
Olson, D. R. & Astington, J. W. Cultural learning and educational process 531
Renshaw, P. Cultural learning *and* teaching: Toward a nonreductionist theory of development 532
Rogoff, B., Chavajay, P. & Matusov, E. Questioning assumptions about culture and individuals 533
Schneuwly, B. Cultural learning is cultural 534

Trevarthen, C. Predispositions to cultural learning in young infants 534
Užgiris, I. Č. Interpersonal interaction as foundation for cultural learning 535
van Oers, B. Developing semiotic activity in cultural contexts 536
Velichkovsky, B. M. From intra- to interpsychological analysis of cognition: Cognitive science at a developmental crossroad 537
Whiten, A. Human enculturation, chimpanzee enculturation(?) and the nature of imitation 538
Wynn, T. Instructed and cooperative learning in human evolution 539

Authors' Response

Tomasello, M., Kruger, A. C. & Ratner, H. H. Culture, biology and human ontogeny 540

Fischer, B. & Weber, H. Express saccades and visual attention **553**

Open Peer Commentary

Albano, J. E. Express saccade programming produces visually triggered saccades 568
Atkinson, J. & Hood, B. Gap effects on saccadic latency in infants and children 568
Bachmann, T. Visual attention is *visual*, too 569
Belopolsky, V. I. The spatial dimension in visual attention and saccades 570
Bracewell, R. M. The express saccade: Autobahn or short circuit of the brain? 571
Breitmeyer, B. G. Express saccades: Attention, fixation or both? 572
Cameron, E. L. & Lennie, P. A speed/accuracy tradeoff in saccadic latency 572
Cavegn, D. Is attention engaged or disengaged in saccade programming? 573
Crawford, T. J. Attentional engagement, disengagement and preparatory intervals 574
Deubel, H. & Schneider, W. X. There is no expressway to a comprehensive theory of the coordination of vision, eye movements and visual attention 575
Findlay, J. M. Does the attention need to be visual? 576
Fischer, M. H. & Rayner, K. On the functional significance of express saccades 577
Forman, S. D., Cohen, J. D. & Johnson, M. H. Frontal eye fields: Inhibition through competition 578
Hallett, P. E. Complexity and modes as factors underlying saccadic latencies 578
Henderson, J. M. Visual attention and saccadic eye movements in complex visual tasks 579
Inhoff, A. W. Visual attention may not control the occurrence of express saccades 580
Jackson, S. & Lees, M. The significance of the basal ganglia in suppressing hyper-reflexive orienting 581
Jüttner, M. & Wolf, W. Express saccade–really a specific type of saccade? 582
Klein, R. M. & Kingstone, A. F. Why do visual offsets reduce saccadic latencies? 583
Nakayama, K. & Mackeben, M. Express attentional shifts 584
Reuter-Lorenz, P. A. & Hughes, H. C. Warning signals, response specificity and the gap effect: Implications for a nonattentional account 585
Robinson, D. L. & Cowie, R. J. Attentional engagement and the pulvinar 586
Ruhnau, E. & Haase, V. G. Parallel distributed processing and integration by oscillations 587
Schall, J. D. & Hanes, D. P. Saccade latency in context: Regulation of gaze behavior by supplementary eye field 588
Sommer, M. A., Schiller, P. H. & McPeek, R. M. What neural pathways mediate express saccades? 589
Tam, W. J. Where do the three central issues stand? 590
Van Gisbergen, J. A. M. & Minken, A. W. H. Toward an alternative scheme for the generation of express saccades 591
Vitu, F. Prediction as an explanation for the occurrence of express saccades 592
Wenban-Smith, M. G. Express saccades: A separable population? 593
West, P. & Harris, C. M. Are express saccades anticipatory? 593
Wright, R. D. & Ward, L. M. Indexing and the control of express saccades 594

Authors' Response

Fischer, B. & Weber, H. Modes of saccade generation and their attentional control 595

Continuing Commentary

On Penrose, R. (1990) Précis of *The emperor's new mind: Concerning computers, minds, and the laws of physics.* BBS 13:643–705. 611

Davis, M. How subtle is Gödel's theorem? 611
Guccione, S. Mind the truth: Penrose's new step in the Gödelian argument 612
Squires, E. J. The incompleteness of quantum physics 613
Wallace, R. Cognitive mapping and algorithmic complexity: Is there a role for quantum processes in the evolution of human consciousness? 614
Wilson, D. L. Quantum theory and consciousness 615

Author's Response

Penrose, R. An emperor still without mind 616

On Schoemaker, P. J. H. (1991) The quest for optimality: A positive heuristic of science? BBS 14:205–245. 622

Keren, G. Optimality as an epistemological organizing principle 622
Rachlin, H. Optimality and Aristotle's concept of final cause 623

Contents Volume 16:4 December 1993

Lubinski, D. & Thompson, T. Species and individual differences in communication based on private states **627**

Open Peer Commentary

Baer, D. M. Perhaps Sisyphus is the relevant model for animal-language researchers 642
Bamberg, M. Communication and internal states: What is their relationship? 643
Baum, W. M. The status of private events in behavior analysis 644
Branch, M. N. The outside route to the inside story 644
Bringsjord, S. & Bringsjord, E. Animal communication of private states does not illuminate the human case 645
Capaldi, E. J. & Proctor, R. W. Plausible reconstruction? No! 646
Davis, L. H. No report; no feeling 647
Garrett, R. A human model for animal behavior 648
Hardcastle, V. G. Communication versus discrimination 649
Hineline, P. N. A promissory note is paid, but has this bought into an illusion? 650
Hocutt, M. Difference without discontinuity 651
Humphreys, L. G. Behaviorism is alive and well 651
Laakso, A. Pigeons and the problem of other minds 652
LaFollette, H. & Shanks, N. Animal modeling in psychopharmacological contexts 653
Laird, J. D. We can reliably report psychological states because they are neither internal nor private 654
Leiber, J. What's *biological* about the continuity? 654
Mitchell, R. W. Pigeons as communicators and thinkers: *Mon oncle d'Amerique deux?* 655
Moore, C. The role of convention in the communication of private events 656
Moore, J. Behaviorism, introspection and the mind's I 657
Mortensen, C. Private states and animal communication 658
Pepperberg, I. M. Communicative acts and drug-induced feelings 659
Plous, S. Animal models of human communication 660
Salzinger, K. How do we know when private events control behavior? 660
Stolerman, I. P. Cross-fertilization between research on interpersonal communication and drug discrimination 661
Thompson, N. S. Are some mental states public events? 662
Zentall, T. R. The assessment of intentionality in animals 663
Zuriff, G. E. What's the stimulus? 664

Authors' Response

Lubinski, D. & Thompson, T. Animal models: Nature made us, but was the mold broken? 664

Dunbar, R. I. M. Coevolution of neocortical size, group size and language in humans **681**

Open Peer Commentary

Andrew, R. J. Behavioural constraints on social communication are not likely to prevent the evolution of large social groups in nonhuman primates 694
Barton, R. A. Independent contrasts analysis of neocortical size and socioecology in primates 694
Brace, C. L. Brain expansion: Thoughts on hunting or reckoning kinship–or both? 695
Byrne, R. W. Do larger brains mean greater intelligence? 696
Corballis, M. C. A gesture in the right direction? 697
Cords, M. Grooming and language as cohesion mechanisms: Choosing the right data 697
Deacon, T. W. Confounded correlations, again 698
Dean, D. Vocal grooming: Man the schmoozer 699
Donald, M. Do grooming and speech really serve homologous functions? 700
Dugatkin, L. A. & Wilson, D. S. Language and levels of selection 701
Falk, D. & Dudek, B. Mosaic evolution of the neocortex 701
Foley, R. A. Ecological and social variance and the evolution of increased neocortical size 702
Freeman, L. C. Group structure and group size among humans and other primates 703
Glezer, I. I. & Kinzey, W. G. Do gossip and lack of grooming make us human? 704
Graber, R. B. Anthropological criticisms of Dunbar's theory of the origin of language 705
Harcourt, A. H. Brains, grouping and language 706
Hauser, M., Gardner, L., Goldberg, T. & Treves, A. The functions of grooming and language: The present need not reflect the past 706
Holloway, R. L. Another primate brain fiction: Brain (cortex) weight and homogeneity 707
Hyland, M. E. Size of human groups during the Paleolithic and the evolutionary significance of increased group size 709
Jacobs, B. & Raleigh, M. J. Sizing up social groups 710
Janson, C. H. Primate group size, brains and communication: A New World perspective 711
Jarvenpa, R. Hunter-gatherer sociospatial organization and group size 712
Jerison, H. J. Number our days: Quantifying social evolution 712
Kincaid, H. Group size, language and evolutionary mechanisms 713
Martins, E. P. Comparative studies, phylogenies and predictions of coevolutionary relationships 714
McCune, L. A developmental look at grooming, grunting and group cohesion 716

Seyfarth, R. M. & Cheney, D. L. Grooming is not the only regulator of primate social interactions 717
Snowdon, C. T. The rest of the story: Grooming, group size and vocal exchanges in neotropical primates 718
Whiten, A. Social complexity: The roles of primates' grooming and people's talking 719
Wind, J. Did primates need more than social grooming and increased group size for acquiring language? 720

Author's Response

Dunbar, R. I. M. On the origins of language: A history of constraints and windows of opportunity 721

Donald, M. Précis of *Origins of the modern mind: Three stages in the evolution of culture and cognition* **737**

Open Peer Commentary

Arbib, M. A. From cooperative computation to man/machine symbiosis 748
Bickerton, D. Putting cognitive carts before linguistic horses 749
Brace, C. L. "Pop science" versus understanding the emergence of the modern mind 750
Bridgeman, B. & Azmitia, M. Mimetic culture and modern sports: A synthesis 751
Chase, P. G. Archaeology and the cognitive sciences in the study of human evolution 752
Clark, A. Symbolic invention: The missing (computational) link? 753
Clarke, T. L. A natural history of the mind: A guide for cognitive science 754
Costall, A. The place of cognition in human evolution 755
Csányi, V. Human evolution: Emergence of the group-self 755
Cynx, J. & Clark, S. J. Ethological foxes and cognitive hedgehogs 756
Deregowski, J. B. What about pictures? 757
Dunbar, R. I. M. The modern mind: Its missing parts? 758
Feldman, J. A. From mimesis to synthesis 759
Fetzer, J. H. Evolution needs a modern theory of the mind 759
Gabora, L. M. Cultural transitions occur when mind parasites learn new tricks 760
Gilhooly, K. J. Working memory and its extensions 761
Halverson, J. Mythos and logos 762
Hampson, P. J. From mimetic to mythic culture: Stimulus equivalence effects and prelinguistic cognition 763
Jerison, H. J. The evolved mind 763
Katz, L. D. The gradual evolution of enhanced control by plans: A view from below 764
Laakso, A. Language equals mimesis plus speech 765
Lutz, R. Lessons from evolution for artificial intelligence? 766
Marshack, A. Correct data base: Wrong model? 767
Mitchell, R. W. & Miles, H. L. Apes have mimetic culture 768
Plotkin, H. C. Hunting memes 768
Small, J. P. Memory, text and the Greek Revolution 769
Thompson, E. Language, thought and consciousness in the modern mind 770
Tomasello, M. It's imitation, not mimesis 771
Vauclair, J. & Fagot, J. Can a Saussurian ape be endowed with episodic memory only? 772
Wills, C. Stages versus continuity 773
Wynn, T. Archaeological evidence for mimetic mind and culture 774
Zhang, J. External representation: An issue for cognition 774

Author's Response

Donald, M. On the evolution of representational capacities 775